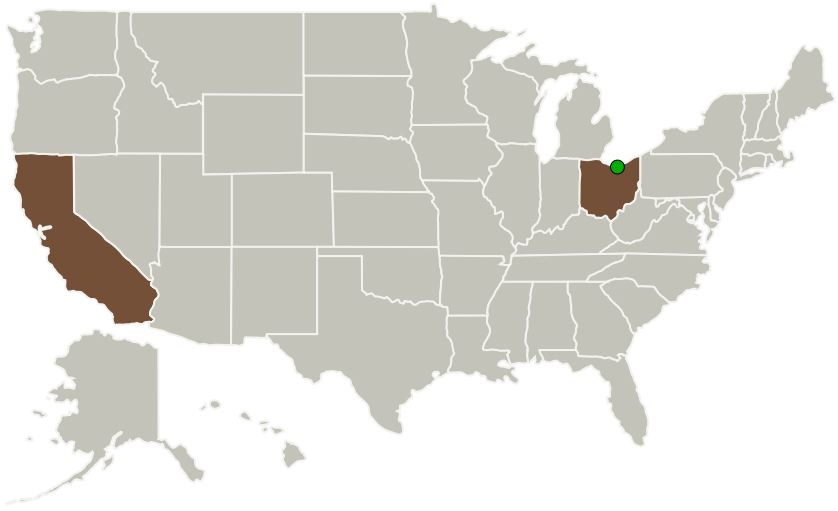
Green Monopropellant Secondary Payload Propulsion System, Phase I

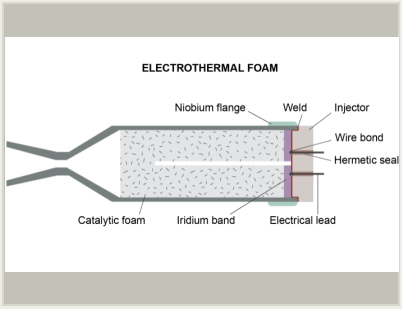
Completed Technology Project (2015 - 2015)

Project Introduction

In recent work for the Air Force, Ultramet demonstrated nearly one thousand restarts with repeatable pulse performance and steady-state burn characteristics using AF-M315E monopropellant and a novel ignition system. Based on the results of that project, Ultramet received a Rapid Innovation Fund (RIF) award from the Air Force to further develop the technology into a flightweight system, including qualification testing of a 22-N AF-M315E thruster by Moog-ISP to bring the technology to TRL 8. Leveraging the previous and ongoing Air Force work, the proposed NASA project will scale the igniter and thruster technology to enable sizing of propulsive capability to a level appropriate for secondary payload satellites, i.e., 1-N and 5-N green monopropellant engines. In Phase I, Ultramet will design and fabricate a 5-N AF-M315E thruster and igniter and hot-fire test it at Pennsylvania State University. Phase II will further miniaturize the thruster and igniter to the 1-N level and bring the technology to TRL 8. Potential Phase II teaming partners include propulsion system integrator Moog-ISP, satellite integrator Ball Aerospace, and Aerospace Corporation for technical oversight.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Ultramet	Lead Organization	Industry	Pacoima, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

June 2015: Project Start

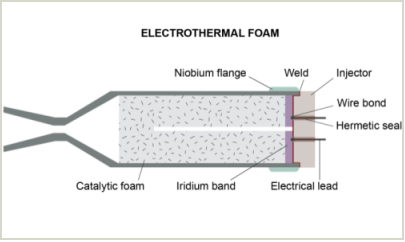
December 2015: Closed out

Closeout Summary: Green Monopropellant Secondary Payload Propulsion System, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139030)*

Images



Briefing Chart Image
Green Monopropellant Secondary Payload Propulsion System, Phase I *(https://techport.nasa.gov/image/134528)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Ultramet

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

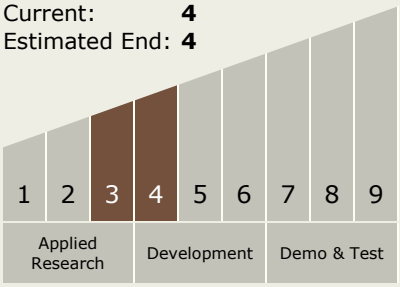
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Matthew J Wright

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.2 Earth Storable

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System